

## CLAIMS

What is claimed is:

1. A method for secure automatic selection of a designated service provider in a peer-to-peer network, comprising:

5                   broadcasting a digitally signed election initiating packet over the network by a sending node in the network, the election packet containing a value for at least one criteria;

                  awaiting one of expiry of response time-out period and receipt of a response election packet;

10                  broadcasting a digitally signed election result packet indicating the sending node is the designated service provider if expiry of response time-out period occurs prior to receipt of a response election packet; and

                  awaiting for, verifying, and storing election result in an election result broadcast if receipt of a response election packet occurs prior to expiry of response time-  
15                  out period.

2. A method for secure automatic selection of a designated service provider of claim 1, the election result broadcast containing a value for the at least one criteria, wherein said verifying election result includes verifying that the value for at least one  
20                  criteria in the response election packet wins over the value for at least one criteria in the initiating election packet.

3. A method for secure automatic selection of a designated service provider of claim 1, further comprising verifying a digital signature of a response election packet upon receipt of the response election packet prior to expiry of response time-out period.

4. A method for secure automatic selection of a designated service provider of claim 1, the response election packet containing a value for the at least one criteria, further comprising verifying that the value for at least one criteria in the response election packet wins over the value for at least one criteria in the initiating election packet.

5. A method for secure automatic selection of a designated service provider of claim 1, wherein the at least one criteria is selected from the group consisting of node name, MAC (media access control) address, Internet access, bandwidth, operating system, and processor speed.

6. A method for secure automatic selection of a designated service provider of claim 1, wherein the response time-out period is at least a sum of maximum delay election response period and round trip transmission time.

7. A method for secure automatic selection of a designated service provider of claim 1, wherein said verifying the election result in the election result broadcast includes verifying a digital signature of the election result broadcast to ensure integrity of the broadcast.

8. A method for secure automatic selection of a designated service provider of claim 1, wherein each of the digitally signed election initiating packet and said digitally signed election result packet is signed by a 1024-bit VeriSign digital certificate.

5 9. A method for secure automatic selection of a designated service provider in a peer-to-peer network, comprising:

receiving and verifying a digitally signed election initiating packet by a receiving node from a sending node in the network, the election packet containing a value for at least one criteria;

10 determining one of the receiving node and sending node as current winner by comparing the value for the at least one criteria in the election initiating packet and a value for the at least one criteria of the receiving node;

awaiting for, verifying, and storing election result in an election result broadcast if the sending node is the current winner;

15 awaiting one of expiry of response delay period and receipt of an additional election packet if the receiving node is the current winner; and

broadcasting a digitally signed election result packet indicating the receiving node is the designated service provider if expiry of response delay period occurs prior to receipt of any additional election packet.

20 10. A method for secure automatic selection of a designated service provider in a peer-to-peer network of claim 9, wherein said verifying election result broadcast includes verifying a digital signature of the election result broadcast.

11. A method for secure automatic selection of a designated service provider in a peer-to-peer network of claim 9, wherein the at least one criteria is selected from the group consisting of node name, MAC (media access control) address, Internet access,  
5 bandwidth, operating system, and processor speed.

12. A method for secure automatic selection of a designated service provider in a peer-to-peer network of claim 9, wherein the response delay period is randomly generated within a predetermined range.

13. A method for secure automatic selection of a designated service provider in a peer-to-peer network of claim 9, wherein each of the election initiating packet and the election result packet is digitally signed by a 1024-bit VeriSign digital certificate.

14. A computer program product for secure and automatic selection of a designated service provider in a peer-to-peer network, comprising:

computer code at a sending node that broadcasts a digitally signed election initiating packet over the network in the network, the election packet containing a value

5 for at least one criteria;

computer code that awaits one of expiry of response time-out period and receipt of a response election packet;

computer code that broadcasts a digitally signed election result packet indicating the sending node is the designated service provider if expiry of response time-out period occurs prior to receipt of a response election packet; and

computer code that awaits for, verifies, and stores election result in an election result broadcast if receipt of a response election packet occurs prior to expiry of response time-out period; and

a computer readable medium that stores said computer codes.

15 15. A computer program product for secure and automatic selection of a designated service provider of claim 14, the election result broadcast containing a value for the at least one criteria, wherein said computer code that verifies election result includes computer code that verifies that the value for at least one criteria in the response  
20 election packet wins over the value for at least one criteria in the initiating election packet.

16. A computer program product for secure and automatic selection of a designated service provider of claim 14, further comprising computer code that verifies a digital signature of a response election packet upon receipt of the response election packet prior to expiry of response time-out period.

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17. A computer program product for secure and automatic selection of a designated service provider of claim 14, the response election packet containing a value for the at least one criteria, further comprising computer code that verifies that the value for at least one criteria in the response election packet wins over the value for at least one criteria in the initiating election packet.

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18. A computer program product for secure and automatic selection of a designated service provider of claim 14, wherein the at least one criteria is selected from the group consisting of node name, MAC (media access control) address, Internet access, bandwidth, operating system, and processor speed.

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19. A computer program product for secure and automatic selection of a designated service provider of claim 14, wherein the response time-out period is at least a sum of maximum delay election response period and round trip transmission time.

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20. A computer program product for secure and automatic selection of a designated service provider of claim 14, wherein said computer code that verifies the election result in the election result broadcast includes computer code that verifies a digital signature of the election result broadcast to ensure integrity of the broadcast.

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21. A computer program product for secure and automatic selection of a designated service provider of claim 14, wherein each of the digitally signed election initiating packet and said digitally signed election result packet is signed by a 1024-bit VeriSign digital certificate.

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22. A computer program product for secure and automatic selection of a designated service provider in a peer-to-peer network, comprising:

computer code at a receiving node that receives and verifies a digitally signed election initiating packet from a sending node in the network, the election packet  
5 containing a value for at least one criteria;

computer code that determines one of the receiving node and sending node as current winner by comparing the value for the at least one criteria in the election initiating packet and a value for the at least one criteria of the receiving node;

computer code that awaits for, verifies, and stores election result in an  
10 election result broadcast if the sending node is the current winner;

computer code that awaits one of expiry of response delay period and receipt of an additional election packet if the receiving node is the current winner;

computer code that broadcasts a digitally signed election result packet indicating the receiving node is the designated service provider if expiry of response  
15 delay period occurs prior to receipt of any additional election packet; and

a computer readable medium that stores said computer codes.

23. A computer program product for secure and automatic selection of a designated service provider of claim 22, wherein said computer code that verifies election  
20 result broadcast includes computer code that verifies a digital signature of the election result broadcast.



24. A computer program product for secure and automatic selection of a designated service provider of claim 22, wherein the at least one criteria is selected from the group consisting of node name, MAC (media access control) address, Internet access, bandwidth, operating system, and processor speed.

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25. A computer program product for secure and automatic selection of a designated service provider of claim 22, wherein the response delay period is randomly generated within a predetermined range.

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26. A computer program product for secure and automatic selection of a designated service provider of claim 22, wherein each of the election initiating packet and the election result packet is digitally signed by a 1024-bit VeriSign digital certificate.

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